

NZ participates in US Department of Defence fuel cell project

Two New Zealand companies are among the first outside the US to participate in a US Department of Defence programme designed to demonstrate the use of small domestic level fuel cells at sites around the world.

Industrial Research engineers will integrate and manage installation of the 2kW fuel cell system with assistance from Hydrogenz Ltd. It will be installed at the International Antarctic Centre in Christchurch, New Zealand where it will power a range of activities from battery charging to yard lighting.

Fuel cells hold considerable promise as a future energy technology due to their ability to combine hydrogen and oxygen to produce electricity very efficiently – with the only by-products being 100 percent pure water and some heat.

This particular fuel cell demonstration has generated a lot of excitement as it is the first site test in New Zealand combining a methanol reformer as part of its power supply rather than the bottled hydrogen typically used.

US-based company ReliOn Inc. is supplying the fuel cells for the project and western region manager, Ken Hydzik, says a fuel cell operating with a methanol reformer will definitely offer customers other options for off-grid and extended run time back-up applications.

“Currently, our customers are deploying commercial fuel cell systems providing eight to 72 hours of backup power operation. For these applications, we typically use bottled hydrogen which is readily available through existing channels.

“However, for some customers’ applications requiring continuous 24/7 or off-grid power due to remoteness of sites, methanol reforming may be a viable alternative solution.”

Because methanol fuel has a higher energy density than bottled hydrogen, it allows for longer runtimes as the same volume of fuel takes up much less space.

Another US company, Genesis Fueltech, is supplying the methanol reformer for the project and president Phillip Piffer says its reformer has made significant engineering breakthroughs for this type of technology.



“This is a complete new generation – the most efficient – the most compact that’s ever been built.”

This fuel cell programme is in its fourth year of operation and US Army Corps of Engineers project manager, Frank Holcomb, says they are ideally positioned to lead the project because of their previous experience and motivation to find alternative solutions for energy provision at military installations.

Currently army personnel rely on diesel generators when in remote sites which Frank Holcomb says are “noisy, pollutant, not efficient and a maintenance problem”.

“A rather surprising statistic to many people also is that almost half of all weight taken into the battlefield is fuel – reducing that is a strong reason for the defence force to look at fuel cells.”

He says the ultimate aim for the US Department of Defence is to have fuel cells that are low maintenance and less of a giveaway as far as noise and emissions are concerned - as any sort of emission can identify them to the enemy. To date, demonstrations at defence sites in the

US have all achieved on average a 90 percent power availability, which is the minimum target set.

The choice of demonstrating a fuel cell in New Zealand was part of the project’s objective to test the reliability of fuel cells in diverse applications and different geographic locations.

“There are all sorts of different issues overseas and we want to document all the projects so if we put these [fuel cells] out enmass then we’ll know more of what to expect.”

Installation of the fuel cell system is expected to take place at the Antarctic Centre next month with operation beginning in December and running for a year. During this time, Industrial Research will provide comprehensive monitoring and performance analysis of the system.

Industrial Research took the project on as part of the company’s wider interest in advancing applications for distributed generation technology and the integration of hydrogen as an energy carrier. This includes a commitment to field demonstration projects and commercialising innovative developments for early niche markets.